

*California Department of Transportation  
Division of Maintenance*

*Structure Maintenance and Investigations*

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**B**<sub>RIDGE</sub>

**I**<sub>NSPECTION</sub>

**R**<sub>ECORDS</sub>

**I**<sub>NFORMATION</sub>

**S**<sub>YSTEM</sub>

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Records for “Confidential” bridges may only be released outside the Department of Transportation upon execution of a confidentiality agreement.



CONDITION TEXT

There is new damage to the west barrier above bent 9. Move 10 m of element 339 to state 4

3/14/2011

A complete inspection from the ground finds this bridge in stable condition. The temporary shoring at the various bents appears to be tight and functioning as designed.

The City of San Bernardino is still keeping truck traffic off the bridge, which is helping maintain the status quo.

The City is also still pursuing replacement final EIR so they can move forward with replacement of this structure.

Overall condition continues to slowly deteriorate.

2/19/2009

The fracture critical inspection performed on 8/13/2007 identified 2 new cracks at bent 7 on the span 6 side in girders 2 and 4 (span 7 has temp shoring under at both bent 7 and 8). It was recommended via telephone conversations with the City of San Bernardino that the situation be evaluated by the engineer of record and additional temp shoring be installed on the span 6 side of bent 7.

The City of San Bernardino has installed additional temporary shoring on the span 6 side of bent 7 to support the bridge where the new cracks were identified.

Further, the city has also restricted truck traffic from using this structure.

During the inspection on 6/16/2008 it was discovered that the center 3 girders of span 6 are experiencing buckling at the skewed bent 7. Girder 4 appears to have the most deformation of the web section with girders 3 and 2 each having less than the previous. This web warpage/buckling is of unclear origin as it is not previously mentioned.

The replacement bridge project is still in EIR phase with replacement to commence by late 2012 to 2014.

8/13/07

Since "temporary" shoring has been in place for approximately 3 years and it will likely be in place until structure is replaced, the bottom beams that are sitting directly on the ground (AC paving) should have their bottom sides inspected for possible rot/decay from trapped moisture, etc. These beams should be rotated or replaced and placed on concrete pads that will allow drainage and prevent rain runoff from affecting timbers. The temporary shoring on the south side of the bridge is all sitting directly on soil under structure.

Most vertical members of the temporary shoring exhibit full length splits that run to the center pulp of the elements, which appear to be due to wood curing/drying. The temporary timber shoring is placed directly on the asphalt of the railroad yard and the area must be kept clean and free of deleterious material that can lead to deterioration of the timber members. Due to vibrations caused by traffic, the shoring wedges must be checked regularly and tightened as needed to maintain bearing.

The temporary shoring system is beyond its design life and needs to be inspected and recertified by the designer of record. This "temporary" system should be recertified on an annual basis at a minimum. A signed and stamped letter certifying that the shoring system is in proper condition and performs as designed should be on file with the city engineer's office and with the BIR at Caltrans.

CONDITION TEXT

## CONDITION OF STRUCTURE

Based on the report dated 4/29/2004 and field inspection on 5/8/2006, it appears that this structure has undergone structure failure.

The existing structure failure locations are currently shored by timber members and the shoring has been designed to take the full structure dead load and live load.

Timber wedges and tie rods were found to be loose on 8/13/2007 and subsequently reset and tightened by Skanska personnel on 8/28/2007.

The condition of this structure is unchanged since the previous inspection except as noted:

- The steel finger joint of Bent 12 has vertical offset in a wave shape due to traffic (60 mm max). (The steel finger joint is lost its functionality)
- The deck of the Bent 19 exhibits 4 different uneven elevations between transverse and longitudinal joints.
- The east exterior steel girder of midspan 20 exhibits 3 m long impact damage from a fork lift in rail yard. (The bottom flange and web are bent in the maximum moment area)
- Most vertical members of the temporary timber shoring exhibit severe splits.
- Debris, soil and bird droppings are accumulating around bases of temporary bents.
- Several sections of both railings have been damaged and have temporary patches in place.

## BEARINGS

The two outboard bearings at bent 22 show signs of pack rust between bearing and base plate which could restrict movement. The vertical alignment of these two bearings appears slightly more rotated than the other 6 bearings.

## PAINT CONDITION

On almost all painted steel elements it is difficult to determine the state of the paint system. There are several areas that are so dark with diesel soot from trucks and trains that it is impossible to tell if the paint system is still in place (bridge top coat is black). There are also extensive efflorescence stains on the steel, particularly at bent caps, as a result of dripping down stringers and bent caps. It is obvious that there is corrosion and deterioration in the many areas. The current condition state for all painted elements is reasonable. (City of San Bernardino is in EIR phase for a replacement bridge with anticipated construction bids in 2010.)

## SAFE LOAD CAPACITY

Based upon the structural failures found during the "fracture critical" steel inspection on April 22nd, 2004 we recommended on April 23rd, 2004 that the City close the two southbound lanes until adequate repairs are made to the damaged bridge elements. The City followed this recommendation immediately. We continued our detailed investigation of the structure during the week of April 26th, 2004. The results of all these investigations are presented in the "Group A Report" dated April 28, 2004 as well as in the section "Condition of Structure" of this Report.

Based upon the structural failures mentioned in this report, the bridge was evaluated for legal loads at the critical locations of deterioration that are currently open to traffic. These include span #7 damage to girders #7 and #8 and bent cap #18.

It was noted in the report that stringers #7 and #8 of span #7 had 60 mm long web cracks at the supports. These cracks are quite large relative to the depth of the stringer (350

CONDITION TEXT

mm) and even larger relative to the reduced depth of the stringer web at the connection (approximately 250 mm). These cracks could continue to grow leading to failure of these stringers. Based upon this assumption we evaluated this span assuming that these damaged stringers were missing. When these girders are missing, the positive moment demand will increase significantly and the deck slab would be inadequate to function due to the insufficient quantity of bottom reinforcement. Consequently, this span would have no live load capacity.

Bent #18 was also evaluated considering section loss at various locations of the top flange. The analysis, which assumed a top flange thickness of 12.5 mm, indicates that the bent cap is adequate to carry legal loads.

## SIGNS

Silhouette-type signs, indicating the weight limits noted under 'EXISTING POSTING', are in place at each approach to the bridge.

## EXISTING POSTING

24 TONS PER TRUCK  
33 TONS PER SEMI-TRAILER COMBINATION

## RECOMMENDED POSTING

We recommended that the City completely close the bridge until adequate repairs are made to the damaged bridge elements. We communicated by phone the results of our analysis and the closure recommendation to Mr. Mike Grubbs, City Engineer, on June 2nd 2004.

## MISCELLANEOUS

For the condition of structure and any structure work recommendations, please refer to the Routine Inspection Report of 4/29/2004 and 5/8/2006.

## NOTES

To ease identification structure was renamed from MOUNT VERNON AVE OH to MOUNT VERNON AVE OH - 1934 to include year built to differentiate from the other structure with the same name built in 1958.

## HISTORY

During Special "Group A" inspection (looking for potential cracks in steel elements) on April 22 2004, CALTRANS found major structural failures (consisting in severe cracks and web buckling) in several steel girders of span 20 as well as their connection to their adjacent steel bent caps. Due to this deteriorated condition, on April 23rd, 2004, Caltrans recommended that the City should close the two southbound lanes until adequate repairs are made to the damaged bridge elements. The City followed this recommendation immediately. Caltrans continued the detailed investigation of the structure during the week of April 26th, 2004. These investigations revealed other major failures in the girders of span 19, 18, 14, and especially in span 7.

Immediately, CALTRANS conducted a detailed engineering analysis to determine the load capacity of the bridge with the account of the existing damaged state. It was determined that keeping this bridge in operation even under restricted load will be a serious safety hazard to traveling public on the bridge and activities of BNSF Railroad underneath.

All these findings and the closure recommendation were presented in two Bridge Inspection Reports submitted to the City in May and June 2004. On June 3, 2004, following the

**CONDITION TEXT**

recommendation of CALTRANS, the City temporarily closed all traffic lanes on north and south bounds of Mt. Vernon Bridge.

Section 35754 of the California Vehicle Code allows the City to keep a bridge closed for a period of less than 90 days with temporarily erected suitable signs at all entrances to the bridge, without public hearing.

The City had proposed to shore up the cracked girders so that the bridge will be capable of carrying the legal live loads and to subsequently re-open the bridge to vehicular traffic. However, due to unforeseen difficulties, the shoring work could not be completed within the 90-day period allowed by Section 35754, which expired on 09/02/04.

Section 35751 of the California Vehicle Code extends the authority to keep a bridge closed for a period in excess of 90 days, subject to specific notification, public hearing and posting of signs as required by the Vehicle Code. Since the City of San Bernardino has a population less than 1,100,000, the Vehicle Code requires that the public hearing will be conducted by CALTRANS.

On 8/30/2004, Public Hearings were held on the engineering investigation of this structure looking toward its closure until work is performed on the structure that will make it capable of carrying the legal live loads. Pursuing to these Hearings, an "Order for the Closure of Bridge No. 54C0066 - Mt Vernon Overhead in the City of San Bernardino" was issued by CALTRANS.

On 10/04/2004 the shoring work was completed and the bridge was re-opened to vehicular traffic.

<b><u>ELEMENT INSPECTION RATINGS</u></b>									
Elem	Total			Qty in each Condition State					
No.	Element Description	Env	Qty Units	St. 1	St. 2	St. 3	St. 4	St. 5	
12	Concrete Deck - Bare	2	4340 sq.m.	0	4340	0	0	0	0
38	Concrete Slab - Bare	2	280 sq.m.	280	0	0	0	0	0
107	Painted Steel Open Girder/Beam	2	1512 m.	0	437	670	190	215	
202	Painted Steel Column or Pile Extension	2	36 ea.	0	0	36	0	0	
205	Reinforced Conc Column or Pile Extension	2	18 ea.	0	18	0	0	0	
215	Reinforced Conc Abutment	2	37 m.	29	7	1	0	0	
228	Timber Submerged Pile	2	1 ea.	1	0	0	0	0	
231	Painted Steel Cap	2	336 m.	0	0	0	96	240	
234	Reinforced Conc Cap	2	56 m.	0	56	0	0	0	
301	Pourable Joint Seal	2	315 m.	0	0	315			
303	Assembly Joint Seal - Modular Type	2	43 m.	0	0	43			
311	Moveable Bearing (roller, sliding, etc.)	2	11 ea.	1	8	2			
339	Concrete Railing (aesthetic/masonry)	2	655 m.	0	432	213	10		
356	Steel Fatigue	2	1 ea.	0	0	1	0	0	
357	Pack Rust	2	1 ea.	0	0	1	0	0	
358	Deck Cracking	2	1 ea.	0	0	1	0	0	
359	Soffit of Concrete Deck or Slab	2	1 ea.	0	0	0	1	0	

Elem No.	Element Description	Total		Qty in each Condition State				
		Env	Qty Units	St. 1	St. 2	St. 3	St. 4	St. 5
362	Traffic Impact	2	1 ea.	0	0	1		
363	Section Loss	2	1 ea.	0	0	0	1	0

**WORK RECOMMENDATIONS**

RecDate: 02/19/2009 Action : Bearings-Clean Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	The bearings at A23 are impacted with dirt and do not appear to rotate properly as the two outboard bearings are rotating in different angles. Pack rust is developing under the bearings restricting their movement.  Clean pack rust and other dirt and debris from around bearing bases to allow free movement.
RecDate: 04/08/2006 Action : Joints-Repair/Clean Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 6 MONTHS DistTarget: EA:	Repair or replace the damaged steel finger joint.
RecDate: 04/08/2006 Action : Super-Strengthen(per Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: EMERGENCY DistTarget: EA:	Heat-Straightening Repairs of Damaged Steel Girder at Span 20.
RecDate: 07/12/2002 Action : Deck-Patch spalls Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair the deck spalls and cover the exposed rebars with polyester concrete.
RecDate: 07/12/2002 Action : Railing-Repair Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair the westerly barrier along the 6 m long portion centered around pier #4.
RecDate: 07/12/2002 Action : Deck-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair the broken slab north of pier #12.
RecDate: 07/12/2002 Action : Deck-Methacrylate Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Clean and seal concrete deck by coating the bridge deck with methacrylate.
RecDate: 08/04/2000 Action : Sub-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair damaged westerly steel column at pier 8.
RecDate: 08/04/2000 Action : Deck-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair sidewalk failures at pier 7, both elevations.

**WORK RECOMMENDATIONS**

RecDate: 08/11/1997  
Action : Mech/Elect-Misc.  
Work By: LOCAL AGENCY  
Status : PROPOSED

EstCost:  
StrTarget: 2 YEARS  
DistTarget:  
EA:

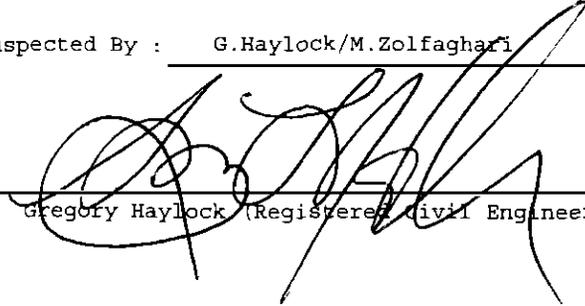
Replace the electrolier cover plate at second and third electrolier from south (westerly barrier).

RecDate: 05/07/1993  
Action : Sub-Patch spalls  
Work By: LOCAL AGENCY  
Status : PROPOSED

EstCost:  
StrTarget: 2 YEARS  
DistTarget:  
EA:

Repair loose concrete and spalls at the following locations:  
a) Southeasterly corner of abutment #1  
b) Westerly face of westerly column of pier #3.  
c) Northerly face of westerly column of pier #4 cap.

Inspected By : G.Haylock/M.Zolfaghari

  
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Gregory Haylock (Registered Civil Engineer)



**STRUCTURE INVENTORY AND APPRAISAL REPORT**

\*\*\*\*\* IDENTIFICATION \*\*\*\*\*

(1) STATE NAME- CALIFORNIA 069  
 (8) STRUCTURE NUMBER 54C0066  
 (5) INVENTORY ROUTE (ON/UNDER)- ON 1500R0400  
 (2) HIGHWAY AGENCY DISTRICT 08  
 (3) COUNTY CODE 071 (4) PLACE CODE 65000  
 (6) FEATURE INTERSECTED- BNSF RY,AMTRAK,UP RR,3RD  
 (7) FACILITY CARRIED- MT VERNON AVE  
 (9) LOCATION- .2 MI S OF RTE 66  
 (11) MILEPOINT/KILOMETERPOINT 0  
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0  
 (13) LRS INVENTORY ROUTE & SUBROUTE  
 (16) LATITUDE 34 DEG 06 MIN 17.4 SEC  
 (17) LONGITUDE 117 DEG 18 MIN 49.6 SEC  
 (98) BORDER BRIDGE STATE CODE % SHARE %  
 (99) BORDER BRIDGE STRUCTURE NUMBER

\*\*\*\*\* STRUCTURE TYPE AND MATERIAL \*\*\*\*\*

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL  
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 302  
 (44) STRUCTURE TYPE APPR:MATERIAL- STEEL  
 TYPE- SLAB CODE 301  
 (45) NUMBER OF SPANS IN MAIN UNIT 16  
 (46) NUMBER OF APPROACH SPANS 6  
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1  
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:  
 A) TYPE OF WEARING SURFACE- NONE CODE 0  
 B) TYPE OF MEMBRANE- NONE CODE 0  
 C) TYPE OF DECK PROTECTION- NONE CODE 0

\*\*\*\*\* AGE AND SERVICE \*\*\*\*\*

(27) YEAR BUILT 1934  
 (106) YEAR RECONSTRUCTED 0000  
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5  
 UNDER- HIGHWAY-RAILROAD 4  
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 02  
 (29) AVERAGE DAILY TRAFFIC 17128  
 (30) YEAR OF ADT 2008 (109) TRUCK ADT 10 %  
 (19) BYPASS, DETOUR LENGTH 2 KM

\*\*\*\*\* GEOMETRIC DATA \*\*\*\*\*

(48) LENGTH OF MAXIMUM SPAN 27.1 M  
 (49) STRUCTURE LENGTH 309.7 M  
 (50) CURB OR SIDEWALK: LEFT 1.1 M RIGHT 1.1 M  
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 12.2 M  
 (52) DECK WIDTH OUT TO OUT 14.9 M  
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 13.4 M  
 (33) BRIDGE MEDIAN- NO MEDIAN 0  
 (34) SKEW 99 DEG (35) STRUCTURE FLARED NO  
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M  
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 12.2 M  
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M  
 (54) MIN VERT UNDERCLEAR REF- HIGHWAY 4.03 M  
 (55) MIN LAT UNDERCLEAR RT REF- RAILROAD 1.5 M  
 (56) MIN LAT UNDERCLEAR LT 0.0 M

\*\*\*\*\* NAVIGATION DATA \*\*\*\*\*

(38) NAVIGATION CONTROL- NOT APPLICABLE CODE N  
 (111) PIER PROTECTION- CODE  
 (39) NAVIGATION VERTICAL CLEARANCE 0.0 M  
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M  
 (40) NAVIGATION HORIZONTAL CLEARANCE 0.0 M

\*\*\*\*\* SUFFICIENCY RATING \*\*\*\*\*

SUFFICIENCY RATING = 2.0  
 STATUS STRUCTURALLY DEFICIENT  
 HEALTH INDEX .0  
 PAINT CONDITION INDEX = 47.0

\*\*\*\*\* CLASSIFICATION \*\*\*\*\*

(112) NBIS BRIDGE LENGTH- YES Y  
 (104) HIGHWAY SYSTEM- NOT ON NHS 0  
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16  
 (100) DEFENSE HIGHWAY- NOT STRAHNET 0  
 (101) PARALLEL STRUCTURE- NONE EXISTS N  
 (102) DIRECTION OF TRAFFIC- 2 WAY 2  
 (103) TEMPORARY STRUCTURE- TEMP STR/COND EXIST T  
 (105) FED.LANDS HWY- NOT APPLICABLE 0  
 (110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0  
 (20) TOLL- ON FREE ROAD 3  
 (21) MAINTAIN- CITY OR MUNICIPAL HIGHWAY AGENCY 04  
 (22) OWNER- CITY OR MUNICIPAL HIGHWAY AGENCY 04  
 (37) HISTORICAL SIGNIFICANCE- ELIGIBLE 2

\*\*\*\*\* CONDITION \*\*\*\*\*

(58) DECK 3  
 (59) SUPERSTRUCTURE 3  
 (60) SUBSTRUCTURE 4  
 (61) CHANNEL & CHANNEL PROTECTION N  
 (62) CULVERTS N

\*\*\*\*\* LOAD RATING AND POSTING \*\*\*\*\*

(31) DESIGN LOAD- M-13.5 OR H-15 2  
 (63) OPERATING RATING METHOD- LOAD FACTOR 1  
 (64) OPERATING RATING- 0  
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1  
 (66) INVENTORY RATING- 0  
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5  
 (41) STRUCTURE OPEN, POSTED OR CLOSED- D  
 DESCRIPTION- OPEN - TEMPORARY SHORING

\*\*\*\*\* APPRAISAL \*\*\*\*\*

(67) STRUCTURAL EVALUATION 2  
 (68) DECK GEOMETRY 2  
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL 2  
 (71) WATER ADEQUACY N  
 (72) APPROACH ROADWAY ALIGNMENT 8  
 (36) TRAFFIC SAFETY FEATURES 0000  
 (113) SCOUR CRITICAL BRIDGES N

\*\*\*\*\* PROPOSED IMPROVEMENTS \*\*\*\*\*

(75) TYPE OF WORK- REPLACE FOR DEFICIENC CODE 31  
 (76) LENGTH OF STRUCTURE IMPROVEMENT 309.7 M  
 (94) BRIDGE IMPROVEMENT COST \$10,646,700  
 (95) ROADWAY IMPROVEMENT COST \$2,129,340  
 (96) TOTAL PROJECT COST \$17,886,456  
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010  
 (114) FUTURE ADT 20287  
 (115) YEAR OF FUTURE ADT 2028

\*\*\*\*\* INSPECTIONS \*\*\*\*\*

(90) INSPECTION DATE 03/11 (91) FREQUENCY 06 MO  
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE  
 A) FRACTURE CRIT DETAIL- YES 24 MO A) 10/09  
 B) UNDERWATER INSP- NO MO B)  
 C) OTHER SPECIAL INSP- NO 48 MO C) 10/09



Photo No. 1  
Routine deck view looking north on Mt Vernon



Photo No. 1  
Routine elevation from distance capture both ends of bridge



DEPARTMENT OF TRANSPORTATION  
Structure Maintenance & Investigations

Bridge Number : 54C0066  
Facility Carried: MT VERNON AVE  
Location : .2 MI S OF RTE 66  
City : SAN BERNARDINO  
Inspection Date : 06/15/2010

## Bridge Inspection Report

Inspection Type  
Routine  FC  Underwater  Special  Other

**STRUCTURE NAME:** MOUNT VERNON AVE OH - 1934

### CONSTRUCTION INFORMATION

Year Built : 1934 Skew (degrees): 99  
Year Widened: N/A No. of Joints : 23  
Length (m) : 309.7 No. of Hinges : 0

Structure Description: The south end is a three-span continuous arch soffit CIP/RC deck slab on closed end backfilled RC cantilever abutment on framed RC column (6) bents. Else, eighteen simple plate girder (5) spans and one simple steel girder (9) span with CIP/RC deck on northerly closed end backfilled RC cantilever abutment and on framed steel column (2) bents, all supported on treated timber piles.

Span Configuration : (S) 3.0 m, 2 @ 7.9 m, 2 @ 12.8 m, 8.8 m, 7.6 m, 15.8 m, 15.2 m, 18.3 m, 27.1 m,  
18.6 m, 3@18.3 m, 18.9 m, 16.8 m, 2@12.2 m, 13.1 m, 2@12.8 m (N) c/c

### LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15  
Inventory Rating: 0 metric tonnes Calculation Method: LOAD FACTOR  
Operating Rating: 0 metric tonnes Calculation Method: LOAD FACTOR  
Permit Rating : XXXXX  
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

### DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.3 m br, 1.1 m sw, 12.2 m, 1.1 m sw, 0.3 m br (E)  
Total Width: 14.9 m Net Width: 12.2 m No. of Lanes: 4  
Rail Description: Concrete Baluster (Aesthetic) Rail Code : 0000  
Min. Vertical Clearance: Unimpaired

### DESCRIPTION UNDER STRUCTURE

Facility Name	Func Class	Lanes	Horiz Clr (m)	Vert Clr (m)
3RD STREET	19	2	6.80	4.03

Channel Description: None.

### CONDITION TEXT

#### RECOMMENDATIONS

Maintain temporary shoring in satisfactory condition until replacement of structure ASAP  
Remove concrete spalls that are loose at B3 on the westerly side of the bridge.

6/15/2010

Condition remains unchanged from below. Temp shoring condition remains unchanged from below

Printed on: Monday 11/01/2010 10:25 AM

54C0066/AAAM/18811

CONDITION TEXT

## REVISIONS

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2/19/2009

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The city of San Bernardino has installed additional temporary shoring on the span 6 side of bent 7 to support the bridge where the new cracks were identified.

Further, the city has also restricted truck traffic from using this structure.

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The replacement bridge project is still in EIR phase with replacement to commence by late 2012 to 2014.

8/13/07

Since "temporary" shoring has been in place for approximately 3 years and it will likely be in place until structure is replaced, the bottom beams that are sitting directly on the ground (AC paving) should have their bottom sides inspected for possible rot/decay from trapped moisture, etc. These beams should be rotated or replaced and placed on concrete pads that will allow drainage and prevent rain run off from affecting timbers. The temporary shoring on the south side of the bridge is all sitting directly on soil under structure.

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## REVISIONS

Bearing section added in "Condition of Structure" text.

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Based upon the structural failures found during the "fracture critical" steel inspection on April 22nd, 2004 we recommended on April 23rd, 2004 that the City close the two southbound lanes until adequate repairs are made to the damaged bridge elements. The City followed this recommendation immediately. We continued our detailed investigation of the structure during the week of April 26th, 2004. The results of all these investigations are presented in the "Group A Report" dated April 28, 2004 as well as in the section "Condition of Structure" of this Report.

Based upon the structural failures mentioned in this report, the bridge was evaluated for legal loads at the critical locations of deterioration that are currently open to traffic. These include span #7 damage to girders #7 and #8 and bent cap #18.

It was noted in the report that stringers #7 and #8 of span #7 had 60 mm long web cracks at the supports. These cracks are quite large relative to the depth of the stringer (350 mm) and even larger relative to the reduced depth of the stringer web at the connection (approximately 250 mm). These cracks could continue to grow leading to failure of these stringers. Based upon this assumption we evaluated this span assuming that these damaged stringers were missing. When these girders are missing, the positive moment demand will increase significantly and the deck slab would be inadequate to function due to the insufficient quantity of bottom reinforcement. Consequently, this span would have no

**CONDITION TEXT**

live load capacity.

Bent #18 was also evaluated considering section loss at various locations of the top flange. The analysis, which assumed a top flange thickness of 12.5 mm, indicates that the bent cap is adequate to carry legal loads.

**SIGNS**

Silhouette-type signs, indicating the weight limits noted under 'EXISTING POSTING', are in place at each approach to the bridge.

**EXISTING POSTING**

24 TONS PER TRUCK

33 TONS PER SEMI-TRAILER COMBINATION

**RECOMMENDED POSTING**

We recommended that the City completely close the bridge until adequate repairs are made to the damaged bridge elements. We communicated by phone the results of our analysis and the closure recommendation to Mr. Mike Grubbs, City Engineer, on June 2nd 2004.

**MISCELLANEOUS**

For the condition of structure and any structure work recommendations, please refer to the Routine Inspection Report of 4/29/2004 and 5/8/2006.

**HISTORY**

During Special "Group A" inspection (looking for potential cracks in steel elements) on April 22 2004, CALTRANS found major structural failures (consisting in severe cracks and web bucklings) in several steel girders of span 20 as well as their connection to their adjacent steel bent caps. Due to this deteriorated condition, on April 23rd, 2004, Caltrans recommended that the City should close the two southbound lanes until adequate repairs are made to the damaged bridge elements. The City followed this recommendation immediately. Caltrans continued the detailed investigation of the structure during the week of April 26th, 2004. These investigations revealed other major failures in the girders of span 19, 18, 14, and especially in span 7.

Immediately, CALTRANS conducted a detailed engineering analysis to determine the load capacity of the bridge with the account of the existing damaged state. It was determined that keeping this bridge in operation even under restricted load will be a serious safety hazard to traveling public on the bridge and activities of BNSF Railroad underneath.

All these findings and the closure recommendation were presented in two Bridge Inspection Reports submitted to the City in May and June 2004. On June 3, 2004, following the recommendation of CALTRANS, the City temporarily closed all traffic lanes on north and south bounds of Mt. Vernon Bridge.

Section 35754 of the California Vehicle Code allows the City to keep a bridge closed for a period of less than 90 days with temporarily erected suitable signs at all entrances to the bridge, without public hearing.

The City had proposed to shore up the cracked girders so that the bridge will be capable of carrying the legal live loads and to subsequently re-open the bridge to vehicular traffic. However, due to unforeseen difficulties, the shoring work could not be completed within the 90-day period allowed by Section 35754, which expired on 09/02/04.

**CONDITION TEXT**

Section 35751 of the California Vehicle Code extends the authority to keep a bridge closed for a period in excess of 90 days, subject to specific notification, public hearing and posting of signs as required by the Vehicle Code. Since the City of San Bernardino has a population less than 1,100,000, the Vehicle Code requires that the public hearing will be conducted by CALTRANS.

On 8/30/2004, Public Hearings were held on the engineering investigation of this structure looking toward its closure until work is performed on the structure that will make it capable of carrying the legal live loads. Pursuing to these Hearings, an "Order for the Closure of Bridge No. 54C0066 - Mt Vernon Overhead in the City of San Bernardino" was issued by CALTRANS.

On 10/04/2004 the shoring work was completed and the bridge was re-opened to vehicular traffic.

<b><u>ELEMENT INSPECTION RATINGS</u></b>									
F#Elem	Element Description	Env	Total Units	Qty in each Condition State					
			Qty	St. 1	St. 2	St. 3	St. 4	St. 5	
101 12	Concrete Deck - Bare	2	4340 sq.m.	0	4340	0	0	0	
101 38	Concrete Slab - Bare	2	280 sq.m.	280	0	0	0	0	
101 107	Painted Steel Open Girder/Beam	2	1512 m.	0	437	670	190	215	
101 202	Painted Steel Column or Pile Extension	2	36 ea.	0	0	36	0	0	
101 205	Reinforced Conc Column or Pile Extension	2	18 ea.	0	18	0	0	0	
101 215	Reinforced Conc Abutment	2	37 m.	29	7	1	0	0	
101 228	Timber Submerged Pile	2	1 ea.	1	0	0	0	0	
101 231	Painted Steel Cap	2	336 m.	0	0	0	96	240	
101 234	Reinforced Conc Cap	2	56 m.	0	56	0	0	0	
101 301	Pourable Joint Seal	2	315 m.	0	0	315			
101 303	Assembly Joint Seal - Modular Type	2	43 m.	0	0	43			
101 311	Moveable Bearing (roller, sliding, etc.)	2	11 ea.	1	8	2			
101 339	Concrete Railing (aesthetic/masonry)	2	655 m.	0	442	213	0		
101 356	Steel Fatigue	2	1 ea.	0	0	1	0	0	
101 357	Pack Rust	2	1 ea.	0	0	1	0		
101 358	Deck Cracking	2	1 ea.	0	0	1	0	0	
101 359	Soffit of Concrete Deck or Slab	2	1 ea.	0	0	0	1	0	
101 362	Traffic Impact	2	1 ea.	0	0	1			
101 363	Section Loss	2	1 ea.	0	0	0	1	0	

**WORK RECOMMENDATIONS**

RecDate: 02/19/2009

Action : Bearings-Clean

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

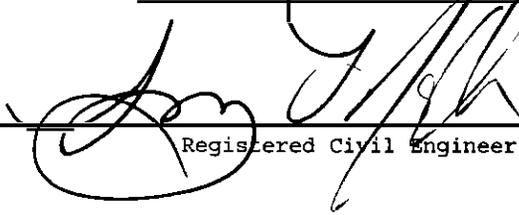
The bearings at A23 are impacted with dirt and do not appear to rotate properly as the two outboard bearings are rotating in different angles. Pack rust is developing under the bearings restricting their movement.

Clean pack rust and other dirt and debris from around bearing bases to allow free movement.

**WORK RECOMMENDATIONS**

RecDate: 04/08/2006 Action : Joints-Repair/Clean Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 6 MONTHS DistTarget: EA:	Repair or replace the damaged steel finger joint.
RecDate: 04/08/2006 Action : Super-Strengthen(per Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: EMERGENCY DistTarget: EA:	Heat-Straightening Repairs of Damaged Steel Girder at Span 20.
RecDate: 07/12/2002 Action : Deck-Patch spalls Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair the deck spalls and cover the exposed rebars with polyester concrete.
RecDate: 07/12/2002 Action : Railing-Repair Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair the westerly barrier along the 6 m long portion centered around pier #4.
RecDate: 07/12/2002 Action : Deck-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair the broken slab north of pier #12.
RecDate: 07/12/2002 Action : Deck-Methacrylate Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Clean and seal concrete deck by coating the bridge deck with methacrylate.
RecDate: 08/04/2000 Action : Sub-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair damaged westerly steel column at pier 8.
RecDate: 08/04/2000 Action : Deck-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair sidewalk failures at pier 7, both elevations.
RecDate: 08/11/1997 Action : Mech/Elect-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Replace the electrolier cover plate at second and third electrolier from south (westerly barrier).
RecDate: 05/07/1993 Action : Sub-Patch spalls Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Repair loose concrete and spalls at the following locations: a) Southeasterly corner of abutment #1 b) Westerly face of westerly column of pier #3. c) Northerly face of westerly column of pier #4 cap.

Inspected By : G.Haylock/KD.Henderson

  
Registered Civil Engineer



**STRUCTURE INVENTORY AND APPRAISAL REPORT**

\*\*\*\*\* IDENTIFICATION \*\*\*\*\*

(1) STATE NAME- CALIFORNIA 069  
 (8) STRUCTURE NUMBER 54C0066  
 (5) INVENTORY ROUTE(ON/UNDER)- ON 1500R0400  
 (2) HIGHWAY AGENCY DISTRICT 08  
 (3) COUNTY CODE 071 (4) PLACE CODE 65000  
 (6) FEATURE INTERSECTED- BNSF RY,AMTRAK,UP RR,3RD  
 (7) FACILITY CARRIED- MT VERNON AVE  
 (9) LOCATION- .2 MI S OF RTE 66  
 (11) MILEPOINT/KILOMETERPOINT 0  
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0  
 (13) LRS INVENTORY ROUTE & SUBROUTE  
 (16) LATITUDE 34 DEG 06 MIN 17.4 SEC  
 (17) LONGITUDE 117 DEG 18 MIN 49.6 SEC  
 (98) BORDER BRIDGE STATE CODE % SHARE %  
 (99) BORDER BRIDGE STRUCTURE NUMBER

\*\*\*\*\* STRUCTURE TYPE AND MATERIAL \*\*\*\*\*

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL  
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 302  
 (44) STRUCTURE TYPE APPR:MATERIAL- STEEL  
 TYPE- SLAB CODE 301  
 (45) NUMBER OF SPANS IN MAIN UNIT 16  
 (46) NUMBER OF APPROACH SPANS 6  
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1  
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:  
 A) TYPE OF WEARING SURFACE- NONE CODE 0  
 B) TYPE OF MEMBRANE- NONE CODE 0  
 C) TYPE OF DECK PROTECTION- NONE CODE 0

\*\*\*\*\* AGE AND SERVICE \*\*\*\*\*

(27) YEAR BUILT 1934  
 (106) YEAR RECONSTRUCTED 0000  
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5  
 UNDER- HIGHWAY-RAILROAD 4  
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 02  
 (29) AVERAGE DAILY TRAFFIC 17128  
 (30) YEAR OF ADT 2008 (109) TRUCK ADT 10 %  
 (19) BYPASS, DETOUR LENGTH 2 KM

\*\*\*\*\* GEOMETRIC DATA \*\*\*\*\*

(48) LENGTH OF MAXIMUM SPAN 27.1 M  
 (49) STRUCTURE LENGTH 309.7 M  
 (50) CURB OR SIDEWALK: LEFT 1.1 M RIGHT 1.1 M  
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 12.2 M  
 (52) DECK WIDTH OUT TO OUT 14.9 M  
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 13.4 M  
 (33) BRIDGE MEDIAN- NO MEDIAN 0  
 (34) SKEW 99 DEG (35) STRUCTURE FLARED NO  
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M  
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 12.2 M  
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M  
 (54) MIN VERT UNDERCLEAR REF- HIGHWAY 4.03 M  
 (55) MIN LAT UNDERCLEAR RT REF- RAILROAD 1.5 M  
 (56) MIN LAT UNDERCLEAR LT 0.0 M

\*\*\*\*\* NAVIGATION DATA \*\*\*\*\*

(38) NAVIGATION CONTROL- NOT APPLICABLE CODE N  
 (111) PIER PROTECTION- CODE  
 (39) NAVIGATION VERTICAL CLEARANCE 0.0 M  
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M  
 (40) NAVIGATION HORIZONTAL CLEARANCE 0.0 M

\*\*\*\*\*

SUFFICIENCY RATING = 2.0  
 STATUS STRUCTURALLY DEFICIENT  
 HEALTH INDEX .0  
 PAINT CONDITION INDEX = 47.0

\*\*\*\*\* CLASSIFICATION \*\*\*\*\* CODE

(112) NBIS BRIDGE LENGTH- YES Y  
 (104) HIGHWAY SYSTEM- NOT ON NHS 0  
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16  
 (100) DEFENSE HIGHWAY- NOT STRAHNET 0  
 (101) PARALLEL STRUCTURE- NONE EXISTS N  
 (102) DIRECTION OF TRAFFIC- 2 WAY 2  
 (103) TEMPORARY STRUCTURE- TEMP STR/COND EXIST T  
 (105) FED.LANDS HWY- NOT APPLICABLE 0  
 (110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0  
 (20) TOLL- ON FREE ROAD 3  
 (21) MAINTAIN- CITY OR MUNICIPAL HIGHWAY AGENCY 04  
 (22) OWNER- CITY OR MUNICIPAL HIGHWAY AGENCY 04  
 (37) HISTORICAL SIGNIFICANCE- ELIGIBLE 2

\*\*\*\*\* CONDITION \*\*\*\*\* CODE

(58) DECK 3  
 (59) SUPERSTRUCTURE 3  
 (60) SUBSTRUCTURE 4  
 (61) CHANNEL & CHANNEL PROTECTION N  
 (62) CULVERTS N

\*\*\*\*\* LOAD RATING AND POSTING \*\*\*\*\* CODE

(31) DESIGN LOAD- M-13.5 OR H-15 2  
 (63) OPERATING RATING METHOD- LOAD FACTOR 1  
 (64) OPERATING RATING- 0  
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1  
 (66) INVENTORY RATING- 0  
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5  
 (41) STRUCTURE OPEN, POSTED OR CLOSED- D  
 DESCRIPTION- OPEN - TEMPORARY SHORING

\*\*\*\*\* APPRAISAL \*\*\*\*\* CODE

(67) STRUCTURAL EVALUATION 2  
 (68) DECK GEOMETRY 2  
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL 2  
 (71) WATER ADEQUACY N  
 (72) APPROACH ROADWAY ALIGNMENT 8  
 (36) TRAFFIC SAFETY FEATURES 0000  
 (113) SCOUR CRITICAL BRIDGES N

\*\*\*\*\* PROPOSED IMPROVEMENTS \*\*\*\*\*

(75) TYPE OF WORK- REPLACE FOR DEFICIENC CODE 31  
 (76) LENGTH OF STRUCTURE IMPROVEMENT 309.7 M  
 (94) BRIDGE IMPROVEMENT COST \$10,646,700  
 (95) ROADWAY IMPROVEMENT COST \$2,129,340  
 (96) TOTAL PROJECT COST \$17,886,456  
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010  
 (114) FUTURE ADT 20287  
 (115) YEAR OF FUTURE ADT 2028

\*\*\*\*\* INSPECTIONS \*\*\*\*\*

(90) INSPECTION DATE 06/10 (91) FREQUENCY 06 MO  
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE  
 A) FRACTURE CRIT DETAIL- YES 24 MO A) 10/09  
 B) UNDERWATER INSP- NO MO B)  
 C) OTHER SPECIAL INSP- NO MO C) 10/09



Photo No. 1  
Partial Elevation Showing Structure Over the BNSF Yard



Photo No. 1  
Spalls developing along the old decoarative barrier



Photo No. 2  
Roadway View of Southbound Lane Closure on Mount Vernon Avenue



Photo No. 2  
Bent cap with a plate spall developing at a corroding rebar



Photo No. 3  
Typical View Pack Rust Corrosion Between the Bent Cap Top Flange and the RC Deck



Photo No. 4  
Close-Up View of Typical Pack Rust Corrosion



Photo No. 5  
View of Bent 18 from Span 18



Photo No. 6  
View of Bent 19 from Span 19



Photo No. 7  
View of Bent 20 from Span 19



Photo No. 8  
View of Bent 19, Girder 2 in Span 19. Shown are Typical Web and Angle Connection Cracks.



Photo No. 9  
Close-Up View of a Typical Girder Web Crack



Photo No. 10  
Close-Up View of a Typical Angle Crack at the Girder to Bent Cap Connection